DOCUMENT RESUME

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IDENTIFIERS	*Preapprenticeship Programs

ABSTRACT

One of a series of pre-apprenticeship phase 1 training modules dealing with math skills, this self-paced student module covers ratio and proportion. Included in the module are the following: cover sheet listing module title, goals, and performance indicators; introduction; study guide/check list with directions for module completion; information sheet; self-assessment; self-assessment answers; and post assessment. Emphasis of the module is on types of problems encountered in the skilled trades. (Other related pre-apprenticeship phase 1 training modules are available separately--see note.) (MN)

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INDIVIDUALIZED LEARNING SYSTEMS

PRE-APPRENTICESHIP
PHASE 1 TRAINING

MATH
RATIO AND PROPORTION

CE-032-925

Goal:

The student will know the necessary math concepts in ratio and proportion to enable him or her to compute math problems in which these concepts are used.

Performance Indicators:

Given a series of math problems in the Self Assessment and Post Assessment portions of this module, the student will be able to successfully compute the answers.

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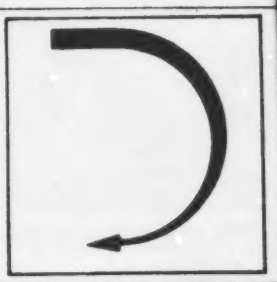
Introduction



Problems in ratio and proportion are frequently encountered in the skilled trades. For example, a machinist employs the concepts of simple and compound ratio in solving problems relating to gearing, and a carpenter employs the concepts of ratio and proportion in working from blueprints or other scale drawings.

Study Guide

This study guide is designed to help you successfully complete this module. Check off the following steps to completion as you finish them.

STEPS TO COMPLETION

1. ____ Familiarize yourself with the Goal and Performance Indicators on the title page of this module.

2. ____ Read the Introduction and study the Information section of the module. It is intended to provide you with the math skills necessary to successfully complete the assessment portions.

3. ____ Complete the Self Assessment section of this module. You may refer to the Information section for help.

4. ____ Compare your Self Assessment answers with the correct answers on the Self Assessment Answer Sheet immediately following the Self Assessment exam. If you missed more than one of the Self Assessment exam questions, go back and re-study the necessary portions of the Information section, or ask your instructor for help. If you missed one or none of these problems, go on to step 5.

5. ____ Complete the Post Assessment section of the module. Show your answers to the instructor. It is recommended that you score 90% or better on those Post Assessment exams with 10 or more problems, or miss no more than one problem on those with fewer than 10 problems, before being allowed to go on to the next math module.

Information

Ratio is a means of expressing a relationship between two or more things mathematically. A ratio is the quotient of two numbers, and it can therefore be expressed as a fraction. The fraction 3/4 expresses the ratio of three to four, which may also be written 3:4. Whan a ratio is expressed in words, the things being related and the numerical terms of the ratio are listed in the same order; for example, if a worker is told to mix sand and cement for a concrete batch in the ratio of three to one, he or she will know that the mixture must include three sacks of sand for every sack of cement, not the reverse.

Proportion is an expression of equality between two ratios. The fraction 3/4 is equal to the fraction 6/8; this is a statement of proportion. The relationship between these equivalents can also be written 3:4::6:8, which is read "three is to four as six is to eight." This simply means that three bears the same relationship to four that six does to eight. If all but one of the terms of a proportion equation are known, the remaining term can be found. This makes possible a useful short method for solving problems like those in which an object must be proportionally increased or reduced in size but where one of the needed dimensions is not known.

Self Assessment

Listed below each problem are four possible answers. Decide which of the four is correct, or most nearly correct; then write the letter for that answer in the space to the left of the problem.

1. ____ The ratio of the height of a building to the length of its shadow is 5 to 9. What is the height of the building if it casts a shadow 90' long?

   a. 50'
   b. 55'
   c. 60'
   d. 65'

2. ____ An architect indicates a 1/8" = 1'0' scale in the drawing of a swimming pool. What is this scale expressed as a ratio?

   a. 1:58
   b. 1:75
   c. 1:85
   d. 1:96

3. ____ A tile subcontractor prepares a shop drawing to a scale of 1" = 1'0". What is this scale expressed as a ratio?

   a. 1:10
   b. 1:12
   c. 1:14
   d. 1:16

4. ____ A contractor estimates that 10 cents of every dollar of his bid will be required for exterior and interior glazing of a building. What is the ratio of the glazing cost to the total building cost?

   a. 1:1
   b. 1:10
   c. 1:100
   d. 1:110

Self Assessment Answers

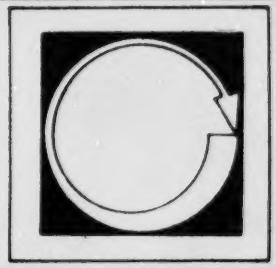
1. a

2. d

3. b

4. b

Post Assessment



Listed below each problem are four possible answers. Decide which of the four is correct, or most nearly correct; then write the letter for that answer in the space to the left of the problem.

1. ____ On a tile job in which fireclay is to be used, a tilesetter tells his helper to mix mortar according to the following formula: 6 buckets of river sand, 1 bucket of fireclay, and 2 buckets of cement. What is the ratio of sand to fireclay in the mixture?

   a. 1:6
   b. 1:2
   c. 3:1
   d. 6:1

2. ____ Referring again to the above problem, what is the ratio of cement to sand in the mixture?

   a. 1:2
   b. 1:3
   c. 1:6
   d. 1:8

3. ____ What is the missing term in the proportion 46:30::92:x?

   a. 20
   b. 40
   c. 60
   d. 80

4. ____ What is the missing term in the proportion 42:x::30:2.5?

   a. 1.75
   b. 3.5
   c. 4.25
   d. 5.75

5. ____ If 5 cu. yd. of concrete cost $60, what will 3 cu. yd. cost?

   a. $36
   b. $42
   c. $48
   d. $54

6. 5 ____ If ten cement masons can place and finish 6,400 sq. ft. of concrete sidewalk in four days, how many cement masons will be needed to place and finish 3,200 sq. ft. of concrete sidewalk in the same amount of time?

   a. three
   b. five
   c. seven
   d. nine